

(wing) orbicular to obovate, 4–5.3 × 3.2–6.3 mm, ciliate; carina 3.8–4.7 mm, 2.2–2.7 mm deep, inner surface puberulent, claw 1–1.3 mm; lateral petal slightly or not widened at apex, puberulent in medial ventral portion, 1.4–1.6 mm wide; rudimentary petal 0.7–0.8 × ca. 0.3 mm; filament sheath 4–5 mm, the free filaments 1.3–2 mm; style strongly curved; ovary with a ring of trichomes at base. Capsule flattened, oblanceolate, dark reddish, 12–17 × 4–6 mm, glabrous; seeds narrowly cylindrical, 6–8 × 1.8–2.7 mm, pubescent for most of length with soft spreading trichomes, at apex with a tuft of long trichomes longer than body of seed; aril apical, white, curved, puberulent.

Distribution and habitat. This species occurs throughout the Brazilian states of Bahia, Minas Gerais, and Goiás and in the Distrito Federal (Marques, 1980; Pastore & Cavalcanti, 2006); it is frequently collected in savanna regions and forest borders.

The specimen at K was chosen as lectotype because it is representative and the best-preserved specimen among the syntypes of *Bredemeyera velutina*. Furthermore, the Kew herbarium has kept an important part of the examined material and notes from Alfred W. Bennett, who prepared the Polygalaceae treatment for *Flora Brasiliensis* (Bennett, 1874).

Selected specimens examined. BRAZIL. s. loc., J. B. E. Pohl 3049 (F not seen, F photo at F, NY, US not seen, US photo at US, W not seen). **Bahia:** Abaíra, caminho de Catolés–Capão, 6 July 1992, W. Ganev 433 (HUEFS); Mucugê, Faz. Pedra Grande, 13°00'20"S, 41°33'48"W, 17 Feb. 1997 (fl.), E. Saar et al. 5833 (HUEFS); Paulo Afonso,

Est. Ecol. do Raso da Catarina, 09°33'08"S, 38°30'47"W, 31 Jan. 2006, M. M. M. Lopes et al. 439 (HUEFS); Piatã, estr. Catolés–Inúbia, 7 July 2008, W. Ganev 803 (HUEFS); Rio de Contas, 13°27'33"S, 41°52'24"W, 4 Feb. 1997, E. Saar et al. 5027 (HUEFS). **Distrito Federal:** ca. 30 km S of Brasília, on rd. to Belo Horizonte, 26 Aug. 1964, H. S. Irwin & T. R. Soderstrom 5611 (NY, RB, UB). **Goiás:** Cavalcante, trilha para a Ponte de Pedra, 20 Apr. 2003, J. F. B. Pastore & E. Sukanuma 514 (CEN, RB). **Minas Gerais:** Viçosa, campus da Univ. Fed. de Viçosa, 12 July 2002, M. M. M. Lopes et al. 118 (HUEFS).

Acknowledgments. I acknowledge Alain Chautems for suggestions; Ricardo Baldini and herbarium staff for kind help during my visit to FI; and Caroline Loup, who kindly made material available at P. I am also grateful to Carla de Lima for drawing the illustration and to the reviewers Roy Gereau, Pete Lowry, and Victoria C. Hollowell for critical suggestions and corrections to the text.

Literature Cited

- Bennett, A. W. 1874. Polygalaceae. Pp. 1–82 in C. F. P. von Martius, A. W. Eichler & I. Urban (editors), *Flora Brasiliensis*, Vol. 13(3). F. Fleischer, Leipzig.
- Candolle, A. P. de. 1824. Polygalaceae. Pp. 321–342 in *Prodromus Systematis Naturalis Regni Vegetabilis*, Vol. 1. Treuttel & Würtz, Paris.
- Marques, M. C. M. 1980. Revisão das espécies Brasileiras do gênero *Bredemeyera* Willd. (Polygalaceae) do Brasil. *Rodriguésia* 32(54): 269–321.
- . 1996. *Securidaca* L. (Polygalaceae) do Brasil. *Arch. Jard. Bot. Rio de Janeiro* 34: 7–144.
- Pastore, J. F. B. & T. B. Cavalcanti. 2006. Polygalaceae. Pp. 109–179 in T. B. Cavalcanti (org.), *Flora do Distrito Federal, Brasil*, Vol. 5. Embrapa Recursos Genéticos e Biotecnologia, Brasília.

A Synopsis, New Combinations, and Synonyms in *Acanthocladus* (Polygalaceae)

José Floriano Barêa Pastore* and Domingos Benício Oliveira Silva Cardoso

Laboratório de Sistemática Molecular de Plantas, LAMOL, Universidade Estadual de Feira de Santana, UEFS, Av. Transnordestina s/n, Campus, Feira de Santana, Bahia, CEP 36-900, Brazil.

*Author for correspondence: jfpastore@hotmail.com

Gerardo A. Aymard C.

Programa de Ciencias de Agro y del Mar, Universidad Nacional Experimental de Los Llanos Occidentales Ezequiel Zamora (UNELLEZ)—Guanare, Herbario Universitario (PORT), 3350 Mesa de Cavacas, Portuguesa, Venezuela

ABSTRACT. A synopsis of the American genus *Acanthocladus* Klotzsch ex Hassk. (Polygalaceae), based primarily on herbarium studies, is presented, along with an identification key to the currently accepted eight species. Two new synonyms and the following new combinations are presented: *A. dukei* (Barringer) J. F. B. Pastore & D. B. O. S. Cardoso, *A. pulcherrimus* (Kuhlm.) J. F. B. Pastore & D. B. O. S. Cardoso, and *A. santosii* (Wurdack) J. F. B. Pastore & D. B. O. S. Cardoso. The names *A. brasiliensis* Klotzsch ex Hassk. and *A. pulcherrimus* are lectotypified.

RESUMO. A partir do estudo das coleções de herbário, uma sinopse de *Acanthocladus* Klotzsch ex Hassk. (Polygalaceae) é apresentada, incluindo chave de identificação para as oito espécies aceitas. Foram feitas também duas novas sinonimizagens e as seguintes novas combinações: *A. dukei* (Barringer) J. F. B. Pastore & D. B. O. S. Cardoso, *A. pulcherrimus* (Kuhlm.) J. F. B. Pastore & D. B. O. S. Cardoso e *A. santosii* (Wurdack) J. F. B. Pastore & D. B. O. S. Cardoso. Além disso, os nomes *A. brasiliensis* Klotzsch ex Hassk. e *A. pulcherrimus* foram lectotipificados.

Key words: *Acanthocladus*, Central America, *Polygala*, Polygalaceae, South America.

Acanthocladus Klotzsch ex Hassk. (Polygalaceae) comprises eight species, occurring from seasonally dry to moist forests in South and Central America. The first species of the genus, *A. brasiliensis* Klotzsch ex Hassk., was originally described (Saint-Hilaire & Moquin-Tandon, 1828) within the African genus *Mundia* Kunth. Klotzsch noted that *M. brasiliensis* A. St.-Hil. & Moq. could represent a new genus and wrote the name *Acanthocladus* on herbarium sheets, but never published it. Subsequently, Hasskarl

(1863–1864) validly published this genus, and Bennett (1874) accepted it and recognized an additional species. Nevertheless, succeeding taxonomic works treated *Acanthocladus* either as a section (Chodat, 1891–1893; Marques, 1984) or subgenus (Paiva, 1998) within the larger genus *Polygala* L. Recent phylogenetic studies based on molecular data (Persson, 2001; Forest et al., 2007) have shown the broad polyphyly of *Polygala* and strongly support the generic circumscription of *Acanthocladus*.

The species of *Acanthocladus* may be recognized by the combination of the following characters: habit shrubby to arborescent, with usually sharply thorny branches; leaves mostly coriaceous to subcoriaceous; flowers papilionaceous and usually congested in brachyblasts, sometimes fasciculate or rarely in racemes with a conspicuous rachis as in *A. santosii* (Wurdack) J. F. B. Pastore & D. B. O. S. Cardoso; sepals caducous in fruit; and capsules woody and dehiscent. Although most of these characters can be said to be plesiomorphic (Persson, 2001), together they are useful in distinguishing *Acanthocladus* from the remaining genera of Polygalaceae.

During our ongoing revision of the *Polygala* species of Bahia State, Brazil, we found it worthwhile to improve the taxonomy of *Acanthocladus*, making use of the results of recent molecular phylogenetic studies. These works supporting the recognition of *Acanthocladus* make it necessary to validate new combinations for species in the genus. Eriksen et al. (2000), in their treatment of Polygalaceae in Ecuador, provided only one new combination and described one new species of *Acanthocladus*. Having reevaluated the circumscription of *Acanthocladus*, we present here a synopsis of the genus, including an identification key to all currently accepted species, new synonyms, and taxonomic transfers for the remaining species.

I. *Acanthocladus* Klotzsch ex Hassk., Ann. Mus. Bot. Lugduno-Batavum 1: 184. 1864. *Polygala* L. sect. *Acanthocladus* (Klotzsch ex Hassk.) Chodat, Mém. Soc. Phys. Genève 31(2): 6. 1893. *Polygala* L. subg. *Acanthocladus* (Klotzsch ex Hassk.) Paiva, Fontqueria 50: 146. 1998. TYPE: *Acanthocladus brasiliensis* Klotzsch ex Hassk.

Shrub to tall tree (25 m or taller); branches usually ending in sharp thorns. Leaves subopposite or alternate, mostly coriaceous to subcoriaceous (membranous in *A. brasiliensis* and *A. guayaquilensis* B. Eriksen & B. Ståhl). Inflorescence usually an axillary, congested

brachyblast, sometimes appearing fasciculate or rarely a raceme with a conspicuous rachis. Flowers papilionaceous, pedicellate; sepals caducous in fruit, free; petals usually whitish purple; carina with apex not crested; stamens 8, the filaments partly joined into a sheath and adnate to lower part of carina; gynoecium curved. Capsule obovate, compressed, dehiscent, pericarp woody; seeds usually 2, puberulent to pubescent, ovoid, with a conspicuous white, carinose aril.

Etymology. The name *Acanthocladus* is from the Greek for “acantha” (spine or thorn) and “clados” (branch), due to the branches ending in thorns, as commonly found in most species.

IDENTIFICATION KEY FOR *ACANTHOCLADUS* SPECIES IN CENTRAL AND SOUTH AMERICA

- 1a. Flowers not in congested racemes, the fertile axis conspicuous, 10–25 mm long 7. *A. santosii*
- 1b. Flowers in very congested racemes, resembling fasciculate umbels, the fertile axis absent to 1 mm long.
 - 2a. Leaves opposite to subopposite.
 - 3a. Tree to 25 m high; leaves ovate; rudimentary petals 2.5–3 mm long, spatulate; Amazon moist forest. 8. *A. scleroxylon*
 - 3b. Shrub, treelet, or tree to 15 m high; leaves ovate-elliptic; rudimentary petals 0.5–1.5 mm long, oblong to narrowly oblong; seasonally dry forest.
 - 4a. Tree to 15 m high; terminal thorns slender to obsolete when mature; leaves rigidly coriaceous, papillate on abaxial surface; pedicels 4–5 mm long; Colombia 3. *A. colombianus*
 - 4b. Shrub, treelet, or small tree to 5 m high; terminal thorns stout; leaves subcoriaceous or membranous, not papillate on abaxial surface; pedicels more than 5 mm long.
 - 5a. Leaves subcoriaceous to coriaceous; racemes 3- to 8-flowered; pedicels 10–15 mm long, glabrous; enlarged lateral sepals elliptic; lateral petals 4–7 mm long, oblanceolate 1. *A. albicans*
 - 5b. Leaves membranous; racemes 2- to 4-flowered; pedicels 5–6 mm long, puberulent; enlarged lateral sepals broadly oblong to almost circular; lateral petals 1.5–2 mm long, narrowly oblong 5. *A. guayaquilensis*
 - 2b. Leaves distinctly alternate.
 - 6a. Shrub 0.8–1.5 m high; leaves 2.2–5 × 1–2.7 cm, papyraceous; flowers 5.5–6.4 mm long. 2. *A. brasiliensis*
 - 6b. Tree 3–14 m high; leaves more than 8.5 × 3.5 cm, coriaceous; flowers 10–15 mm long (but unknown in *A. dukei*).
 - 7a. Leaves 8.5–11.5 × 3.5–6.2 cm, 1.8–2.4× as long as wide, mostly ovate to broadly lanceolate; peduncle of fruits ca. 0.5 cm long; Panama 4. *A. dukei*
 - 7b. Leaves (10–)13–25 × (3–)4–8 cm, 2.1–3.9× as long as wide, lanceolate to elliptic; peduncle of fruits 1–2.1 cm long; Brazilian Atlantic Forest 6. *A. pulcherrimus*

1. *Acanthocladus albicans* A. W. Benn., in Eichler & Urban, Fl. Bras. 13(3): 46. 1874. *Polygala bicolor* Vell., Fl. Flumin. Icon. 7: 59. 1831, non *Polygala bicolor* Kunth, in HBK, Nov. Gen. Sp. (quarto ed.) 5: 394, tab. 507. 1823, nom. illeg. *Polygala bennettii* Chodat, Mém. Soc. Phys. Genève 30(8): 113. 1889, nom. superfl. *Polygala albicans* (A. W. Benn.) Grondona, Darwiniana 8(2–3): 291. 1948. TYPE: Vellozo 7: tab. 59. 1827 (lectotype, designated by Marques [1984: 7]). Figure 1.

Polygala albicans (A. W. Benn.) Grondona var. *caracaensis* Glaz. ex Marques, Rodriguésia 36(60): 7. 1984, as *caracaensis*, syn. nov. TYPE: Brazil. Minas Gerais: “Entre Inficionado et Caraça,” 1885 (fl.), Glaziou 14493 (holotype, B not seen; isotypes, G not seen, G photo at G, K, P).

Polygala albicans (A. W. Benn.) Grondona var. *silvae* Marques, Rodriguésia 36(60): 7. 1984, syn. nov. TYPE: Brazil. Goiás: Rio Araguaia, Rio Coco, margem esquerda, 15 Aug. 1978 (fl.), N. T. Silva 4830 (holotype, MG; isotype, RB).

Distribution and habitat. *Acanthocladus albicans* is the most widespread species of the genus. It occurs mainly in dry forest and shrubby caatinga of northeastern Brazil, ranging southward in semideciduous forests in the states of Minas Gerais and Rio de Janeiro, southeastern Brazil, and in some enclaves of dry forest in the state of Goiás and the central Brazilian plateau (extending to the dry forest within the boundaries of the Chaco dominium in southeastern Bolivia and northeastern Argentina and Paraguay) (Fig. 1).

Discussion. Marques (1984) separated *Acanthocladus albicans* into three varieties. We find that her

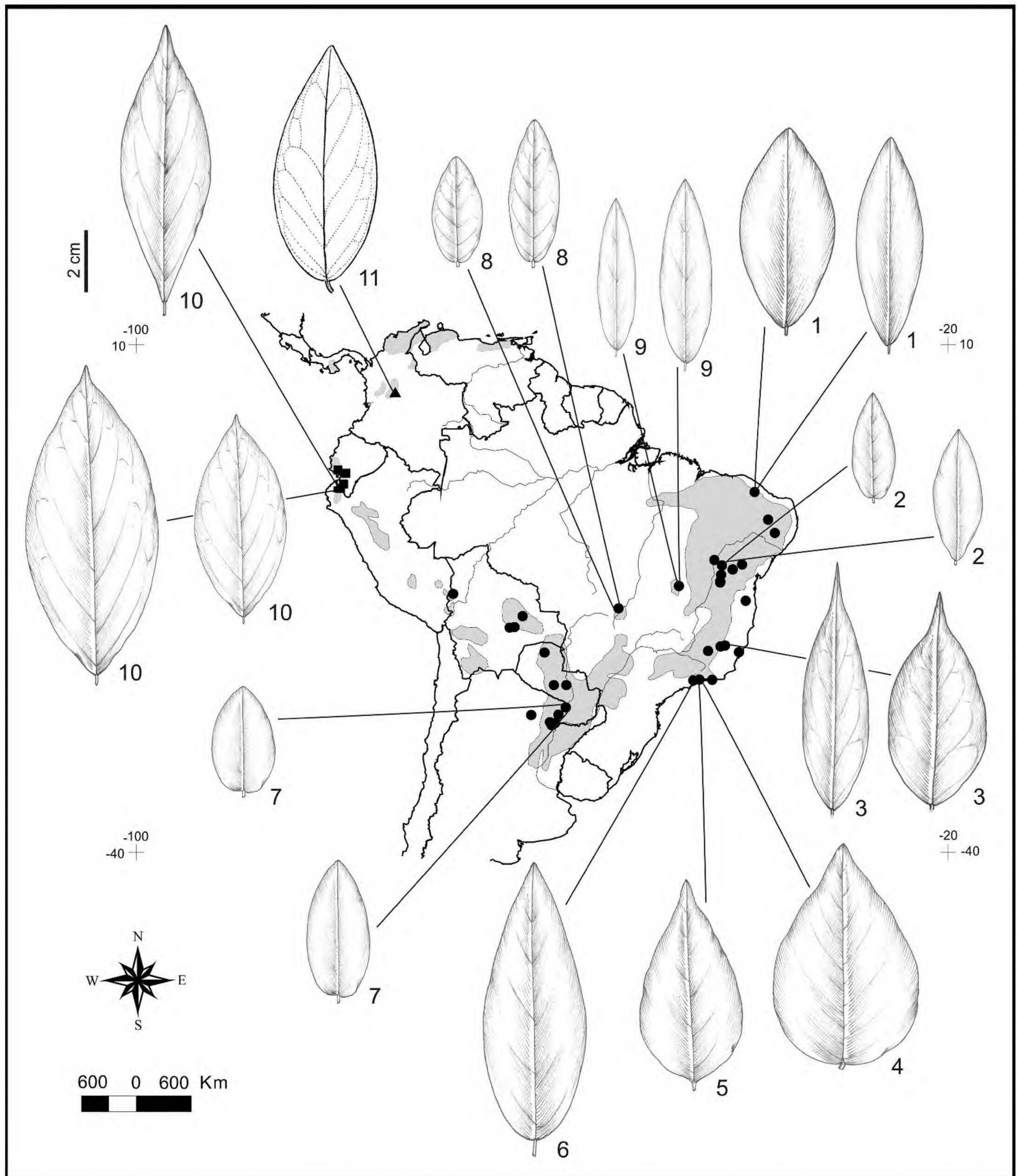


Figure 1. Geographical distribution map for the *Acanthocladus albicans* complex with variation of leaf morphology throughout their range within the Neotropical seasonally dry tropical forest (SDTF) dominium (light gray): *A. albicans* (●), *A. colombianus* (▲), and *A. guayaquilensis* (■). The leaf outlines are from: 1. T. S. Guedes 486; 2. F. B. Ramalho 103; 3. K. B. Strier 1232; 4. L. C. Giordano et al. 1404; 5. M. G. Bovini et al. 479; 6. M. C. Marques 198; 7. E. Zardini & P. Aquino 34730; 8. N. T. Silva 4830 (type, *Polygala albicans* var. *silvae*); 9. M. L. Fonseca 2973 (*A. albicans*); 10. X. Cornejo & C. Bonifaz 6028 (type, *A. guayaquilensis*); 11. B. Maguire & C. K. Maguire 44019 (type, *A. colombianus*).

characters for distinguishing the varieties overlap. In addition, these varieties can occur sympatrically across the species range. Taking into account its widespread geographical distribution in South America, *A. albicans* seems to constitute a single species displaying great variation in its leaf morphology

(Fig. 1). Therefore, we do not accept here the varieties proposed by Marques (1984). *Acanthocladus albicans* closely resembles *A. colombianus* Aymard & J. F. B. Pastore and *A. guayaquilensis* in leaf morphology and petal size, but can be distinguished by the combination of leaves subcoriaceous to coriaceous (vs. hardly

coriaceous in *A. colombianus* and membranous in *A. guayaquilensis*) and not papillate on the abaxial surface (vs. papillate in *A. colombianus*), pedicels 10–15 mm long (vs. 4–5 mm long in *A. colombianus* and 5–6 mm long in *A. guayaquilensis*), enlarged lateral sepals elliptic (vs. oblong in *A. colombianus* and broadly oblong to almost circular in *A. guayaquilensis*), and oblanceolate, 4–7 mm long lateral petals (vs. oblong, 3–4 mm long in *A. colombianus* and narrowly oblong, 1.5–2 mm long in *A. guayaquilensis*).

Although *Polygala bicolor* Vell. is the oldest name for *Acanthocladus albicans*, it is a later homonym of *P. bicolor* Kunth. Following Article 53.1 of the *International Code of Botanical Nomenclature* (ICBN; McNeill et al., 2006), the name *P. bicolor* Vell. is illegitimate and, therefore, its epithet does not have priority when used in combination with the genus *Acanthocladus* (Art. 45.3). Because *A. albicans* was published as a substitute for *P. bicolor*, it must be based on the same type collection (Art. 7.3). *Polygala bennettii* Chodat (1889) was published as a replacement name for *A. albicans*, although the epithet *albicans* was available in *Polygala* and should have been adopted (Grondona, 1948), rendering the name *P. bennettii* nomenclaturally superfluous under Article 52.1. Marques (1984) designated the plate (Vellozo, 1827: tab. 59) as the lectotype of *P. bicolor* Vell., and thus also the type of *A. albicans* and *P. bennettii*. Nevertheless, Bernardi (2000) did not follow this previous lectotypification and considered *Glaziou 5820* as the type for *P. albicans*.

Additional specimens examined. (An asterisk [*] indicates specimens mapped in Fig. 1.) ARGENTINA. **Chaco:** *P. Jørgensen 2091* (GH). **Corrientes:** San Cosme, *A. Krapovickas 13013* (MO); Itatí, bank of Río Paraná, *T. M. Pedersen 7080* (NY), *T. Ibarrola 908* (NY); Corrientes, *T. Meyer 5893* (GH), *L. R. Parodi 11939* (GH); Río Paraná, Puerto González, *T. Ibarrola 758* (NY). **Formosa:** *A. Krapovickas & C. L. Cristóbal 13072* (MO). BOLIVIA. **La Paz:** Franz Tamayo, Parque Nac. Madidi, *V. M. Torres et al. 208* (MO). **Santa Cruz:** A. Ibáñez, Cotoca, Camino a Paurito, *G. Coimbra S. 694* (NY); 7 km SE of Comun. Don Lorenzo, *M. Nee 40190* (NY). BRAZIL. **Bahia:** Ibipecta, Faz. São Vicente, **F. B. Ramalho 103* (RB); Itaju do Colônia a Feirinha, *T. N. Santos 404* (CEPEC); Utinga, *J. E. M. Brazão 3* (RB). **Ceará:** Serra do Bezouro, **T. N. Guedes 486* (NY, RB). **Espírito Santo:** Santa Teresa, Várzea Alegre, *V. Demuner et al. 938* (RB). **Goiás:** Rio Araguaia, Margem do Rio Coco, *N. T. Silva 4830* (NY, RB); São Domingos, Gruta de Terra Ronca, **M. L. Fonseca 2973* (CEN, IBGE, RB). **Minas Gerais:** Caratinga, Est. Ecol. de Caratinga, **K. B. Strier 1232, 1335* (NY); Serra da Caraça, *Glaziou 14493* (B, P). **Paraíba:** Maturéia, *M. F. Agra et al. 4416* (MO). **Pernambuco:** Floresta, Reserva Biol. de Serra Negra, *M. J. N. Rodal 683* (RB). **Rio de Janeiro:** Maricá, Ponta do Fundão, *M. C. L. Ramos 1357* (RB); Parati, Parati-Mirim, Ilha da Cotia, APA Cairuçu, **L. C. Giordano et al. 1404* (RB), **M. G. Bovini et al. 479* (RB); Parati, Praia de Jabaquara, **M. C. Marques 198* (RB); Praia Grande, Morro

do Cavalão, *Glaziou 5820* (K, MPU, P, US). PARAGUAY. **Alto Paraguay:** *L. Molas & V. Vera 1101* (MO). [**Amambay:**] N. Paraguay, entre Río Apa y Río Aquidaban, *K. Fiebrig 4771, 5134* (GH). **Central:** Estero de Yapá, Puerto Guyrati, Villa Oliva, **E. Zardini & A. Aquino 34730* (RB); Concepción, *E. Hassler 7293* (GH, NY). **Presidente Hayes:** *E. Zardini & L. Guerrero 40510* (MO).

2. *Acanthocladus brasiliensis* Klotzsch ex Hassk., Ann. Mus. Bot. Lugduno-Batavum 1: 184. 1864. *Mundia brasiliensis* A. St.-Hil. & Moq., Ann. Soc. Sci. Orléans 9: 56. 1828. *Polygala klotzschii* Chodat, Mém. Soc. Phys. Genève 30(8): 114. 1889, non *Polygala brasiliensis* L., Mant. Pl. 1: 99. 1767. TYPE: Brazil. São Paulo: prov. de Saint-Paul, 1816 (fl.), *A. Saint Hilaire C1 1061* (lectotype, designated here, P).

Distribution and habitat. *Acanthocladus brasiliensis* is markedly characterized by the shrubby habit with very thorny branches, leaves small, alternate, and papyraceous, and the inflorescences 1- to 3(4)-flowered. It is found in the Brazilian states of Rio de Janeiro, São Paulo, Paraná, and Mato Grosso do Sul, in areas of savannas and of disturbed forests (Marques, 1984).

Discussion. Chodat (1889) in a broad delimitation of *Polygala*, which included two *Acanthocladus* species, could not use the epithet *brasiliensis* to make a new combination in the genus *Polygala* because of the precedence of *P. brasiliensis* L. We chose *A. Saint Hilaire C1 1061* (P #00647133) as lectotype because it is undoubtedly part of the original materials used by Saint-Hilaire and Moquin-Tandon (1828) and consists of a representative and well-preserved specimen that matches with the original description and illustration of the species.

Additional specimens examined. BRAZIL. **Mato Grosso do Sul:** Amambaí, *Dobereiner & Tokarnia 895* (RB). **Paraná:** *G. Hatschbach et al. 8767* (MBM, MO). **São Paulo:** prov. de Saint-Paul, *A. Saint Hilaire C2 1261* (P), *A. Saint Hilaire s.n.* (P); Bragança Paulista, *R. Mello-Silva et al. 372* (NY, RB, SPF); Campinas, Santa Elisa, *H. F. Leitão F. & N. Taroda 2613* (NY); Ibiúna, bairro Sorocabuçu, ca. 8 km da SP-250 NO Km 63, *T. Yano & O. Yano 49* (RB, SP); Iperó, Faz. Ipanema, *R. R. Rodrigues et al. 94* (RB); Jaguariúna, *J. Mattos 9084* (RB, SP); Jundiá, 25 Sep. 1949, *F. C. Hoehne s.n.* (NY, RB, SP); Limeira, próx. a Limeira, 25 Sep. 1951, *F. C. Hoehne s.n.* (NY, RB, SPF); Monte Alegre-Amparo, *M. Kuhlmann 917* (RB, SP); Pilar do Sul, 5 km N da cidade, *J. Mattos 9215* (RB, SP); Santa Bárbara do Oeste, E edge of city, on E side of hwy. just S of railroad, *G. Eiten et al. 5712* (RB, SP); São Paulo, Jardim Botânico de São Paulo, *L. Rodrigues 68* (GH, RB, SP); Sarapuí, Rod. Raposo Tavares, Km 157, Faz. Aterradinho, 10 Sep. 1989, *E. S. Petty s.n.* (ESA, RB); Serra do Japí, ca. 10 km SW of Jundiá, *H. F. Leitão F. et al. 3180* (NY); Sorocaba, próx. a Brigadeiro Tobias, *A. S. Grotta s.n.* (RB); Teodoro Sampaio, Morro do Diabo, *S. Romaniuc-Neto et al. 1214* (RB, SP); Valinhos,

Serra dos Cocais, *R. G. Udulutsch et al.* 24 (HUEFS); Vinhedo, Estação de tratamento de água, 23 Sep. 1977, *H. Makino s.n.* (RB, SP).

3. *Acanthocladus colombianus* Aymard & J. F. B. Pastore, *Caldasia* 31(1): 14. 2009. TYPE: Colombia. [Cundinamarca:] 16 km below Fusagasugá, semixeric tableland, 1200 m, 19 Aug. 1959 (fl., fr.), *B. Maguire & C. K. Maguire 44019* (holotype, NY). Figure 1.

Distribution and habitat. This species is only known from the type collection gathered in an area of seasonally dry forest of the inter-Andean valley of Cundinamarca Department, Colombia (Fig. 1), thus representing the first record of the genus from the Andes (Aymard & Pastore, 2009).

Discussion. *Acanthocladus colombianus* is very closely related to *A. albicans* and *A. guayaquilensis*, but it can be distinguished from both by an arborescent habit ca. 15 m high, smaller to obsolete terminal thorns, leaves that are rigidly coriaceous and papillate on the abaxial surface, and flowers with shorter pedicels (4–5 mm long vs. more than 5 mm long).

4. *Acanthocladus dukei* (Barringer) J. F. B. Pastore & D. B. O. S. Cardoso, comb. nov. Basionym: *Polygala dukei* Barringer, *Ann. Missouri Bot. Gard.* 70: 203. 1983. TYPE: Panama. Darién: the Bolimina, s.d. (fr.), *J. A. Duke & N. Brista 385* (holotype, US not seen, US photo at US).

Distribution and habitat. *Acanthocladus dukei* is only known by the type collection and is the single species of the genus found in Central America, where it occurs in the tropical evergreen forest of Darién Province.

Discussion. *Acanthocladus dukei* closely resembles *A. pulcherrimus* (Kuhlm.) J. F. B. Pastore & D. B. O. S. Cardoso based mainly on its alternate leaves, as well as on the arborescent habit, with the branches not ending in thorns, and a similar fruit size and shape. Although the flowers of *A. dukei* are still unknown, this species can be recognized by its fruits with a very short, ca. 0.5-cm-long peduncle (vs. the peduncles 1–2.1 cm long in *A. pulcherrimus*) and leaves that are usually smaller, 8.5–11.5 × 3.5–6.2 cm, and ovate to broadly lanceolate (vs. leaves 13–23 × 4–8 cm, lanceolate to elliptic in *A. pulcherrimus*).

5. *Acanthocladus guayaquilensis* B. Eriksen & B. Ståhl, *Fl. Ecuador* 65: 7. 2000. TYPE: Ecuador. Loja: Bosque Petrificado Puyango, Quebrada El

Chirimoyo, 03°53'S, 80°04'W, 17 Feb. 1998 (fl.), *X. Cornejo & C. Bonifaz 6028* (holotype, GUAY not seen; isotypes, GB not seen, MO, NY). Figure 1.

Discussion. This species can be diagnosed by the combination of membranous leaves and few-flowered racemes, these flowers borne on short (5–6 mm long), puberulent pedicels, with enlarged lateral sepals broadly oblong to almost circular and the lateral petals narrowly oblong, 1.5–2 mm long. *Acanthocladus guayaquilensis* is part of a species complex that includes *A. albicans* and *A. colombianus*. Although these species share several morphological characters, their geographic range does not overlap. *Acanthocladus guayaquilensis* is endemic to the dry forests of Pacific coastal Ecuador. The geographic distribution of this species complex on disjunct areas of dry vegetation is in accordance with the distribution pattern of several Neotropical plant species or groups of closely related species that have been used to define the Neotropical seasonally dry tropical forest (SDTF) dominium (Pennington et al., 2000; Prado, 2000) as shown in Figure 1.

Additional specimens examined. ECUADOR. **El Oro/Loja:** Bosque petrificado Puyango, Quebrada El Inca, *X. Cornejo & Cornejo 4088* (GB, GUAY, K, MO); Quebrada El Chirimoyo, *X. Cornejo & Cornejo 4103* (GB, GUAY, K, MO). **Guayas:** Reserva Ecol. Manglares Churute, quebrada del Cerro Cimalón, *X. Cornejo & C. Bonifaz 5124* (GB, GUAY, MO); Cordillera del Naranjo, hills NW of Salanguillo, *Valverde 1703* (MO).

6. *Acanthocladus pulcherrimus* (Kuhlm.) J. F. B. Pastore & D. B. O. S. Cardoso, comb. nov. Basionym: *Polygala pulcherrima* Kuhlm., *Arq. Inst. Biol. Veg.* 2(1): 83. 1935. TYPE: Brazil. Espírito Santo: Vale do Rio Doce, Lagoa Juparana, 30 Mar. 1934 (fl.), *J. G. Kuhlmann 101* (lectotype, designated here, RB 1685).

Discussion. Although Kuhlmann (1935) properly typified this species, it is worthwhile to discuss its complex history. First, Bentham (1837) published *Corytholobium macrophyllum* Benth. within Fabaceae, changing later (1867) its family placement to Polygalaceae (Bernardi, 2000). Then, Bennett (1874) published *Securidaca corytholobium* Benth. ex A. W. Bennett as a new name for *C. macrophyllum* in the Polygalaceae, providing an illustration based on a confusion of two different species and genera, and citing three different specimens, *Blanchet 2087*, *Burchell 9733*, and *Poeppig 2826*. According to Article 7.3 of the ICBN (McNeill et al., 2006), *S. corytholobium* must have the same type as *C. macrophyllum*, i.e., *Poeppig 2826*. Furthermore, the

other species in Bennett's illustration, representing the collection *Blanchet 2087*, was later described as *Polygala pulcherrima* by Kuhlmann (1935), who chose different type collections (*Kuhlmann 101* and *Velho s.n.*), possibly to avoid even more confusion. We chose *Kuhlmann 101* as lectotype because it is better preserved and also the first collection cited in the protologue.

Acanthocladus pulcherrimus together with *A. dukei* and *A. santosii* are the only species of the genus that do not have thorny branches. *Acanthocladus pulcherrimus* is distinguished by the combination of its remarkably large leaves, sometimes reaching 25 cm long (vs. 8.5–11.5 cm long in *A. dukei*), and its congested racemes, resembling fasciculate umbels (vs. flowers in racemes with a well-developed axis in *A. santosii*). It occurs in the Atlantic rainforest and matas de tabuleiro of the states of Bahia, Espírito Santo, Minas Gerais, and Rio de Janeiro.

Additional specimens examined. BRAZIL. **Bahia:** Ad Ripas, *Blanchet 2087* (BR, K); Ilhéus, area do CEPEC, Km 22, rod. Ilhéus–Itabuna, *J. L. Hage & T. S. Santos 1766* (CEPEC, HUEFS, RB); Una, Faz. São Rafael, *R. S. Pinheiro 313* (CVRD, NY); Taboquinhas, *T. S. Santos 1773* (NY). **Espírito Santo:** Boa Esperança, *L. Kollmann et al. 10204* (MBML); Ibiraçu, prox. da estrada 101, Linhares, Reserva Nat. da CVRD, *D. A. Folli 4679* (CVRD); Linhares, Bananal, *P. P. P. Velho s.n.* (R not seen, RB 19063); Linhares, Km 10 da rod. a Bananal lado N, *T. S. Santos 2017* (CEPEC, RB); Pedro Canário, Faz. São Joaquim, *G. Martinelli et al. 11847* (NY, RB); Santa Leopoldina, Santa Lúcia, *L. Kollmann et al. 4060* (MBML, RB). **Minas Gerais:** Itueta, *E. Tameirão-Neto 2464* (HUEFS). **Rio de Janeiro:** São João da Barra, Guaxindiba, Faz. São Pedro, *H. C. Lima et al. 5222* (RB).

7. *Acanthocladus santosii* (Wurdack) J. F. B. Pastore & D. B. O. S. Cardoso, comb. nov. Basionym: *Polygala santosii* Wurdack, *Bradea* 3: 17. 1979. TYPE: Brazil. Bahia: Km 36 da Rod. BR 101, de Teixeira de Freitas à Itamarajú, 16 Aug. 1972 (fl.), *T. S. Santos 2392* (holotype, CEPEC; isotypes, RB, US not seen, US photo at US). Figure 2.

Distribution and habitat. *Acanthocladus santosii* is putatively endemic in southern Bahia and northern Espírito Santo, an important region of the Atlantic forest known for its endemic taxa and deserving special attention for its conservation (Thomas et al., 1998).

Discussion. Wurdack (1979) in his original description of *Polygala santosii* noted its morphological resemblance to *P. pulcherrima* [= *Acanthocladus pulcherrimus* (Kuhlmann) J. F. B. Pastore & D. B. O. S. Cardoso], but did not assign *P. santosii* to any section of *Polygala*. In the most recent revision of the

Brazilian *Acanthocladus* species by Marques (1984), as well as in Bernardi's (2000) account of *Polygala*, *A. santosii* was overlooked or perhaps deliberately excluded from *Polygala* sect. *Acanthocladus* due to its noticeably different inflorescence, which is an elongate raceme. We here suggest that racemes in *A. santosii* do not significantly differ from the inflorescences found in the remaining species of the genus, except for a more conspicuous elongation of the fertile internodes and axis. The other characters that lead us to place *P. santosii* within *Acanthocladus* without hesitation include the caducous sepals in fruit and the morphology of the flower, fruit, and seed. *Acanthocladus santosii* is herein illustrated for the first time (Fig. 2).

Additional specimens examined. BRAZIL. **Bahia:** Itagimirim, Faz. Benfica, *M. M. Santos & J. C. A. Lima 137* (HRB, RB); Porto Seguro, Parque Nac. de Monte Pascoal, *W. W. Thomas 11232* (HUEFS, NY), *11351* (CEPEC, HUEFS, NY). **Espírito Santo:** Linhares, Vale do Rio Doce, *T. S. Santos 947* (CEPEC, RB); Sooretama, Reserva Flor. de Sooretama, *D. Sucre 5437* (RB).

8. *Acanthocladus scleroxylon* (Ducke) B. Eriksen & B. Ståhl, *Fl. Ecuador* 65: 6. 2000. Basionym: *Polygala scleroxylon* Ducke, *Trop. Woods* 50: 35. 1937. TYPE: Brazil. Amazonas: Humaytá, betw. Rio Madeira & Lago Paraiso, 26 June 1936 (fl.), *A. Ducke s.n. [315]* (holotype, RB 29038; isotypes, F not seen, F photo at F, GH, K, MG, MO, NY, P, US not seen, US photo at US).

Discussion. *Acanthocladus scleroxylon* is the only species of the genus occurring across the Amazon Basin (Brazil, Ecuador, and Peru). It is morphologically close to *A. albicans*, but differs by the combination of puberulent pedicels and longer rudimentary petals, 2.5–3 mm long (vs. pedicels glabrous and rudimentary petals 0.5–1.5 mm in *A. albicans*), as well as the arboreal habit that can reach 25 m in height.

Additional specimens examined. PERU. **Loreto:** Quebrada Sucursari, *Gentry et al. 54305* (K, MO, NY). **Madre de Dios:** Manú, Río Manú, Cocha Cashu station, *W. R. Foster 9559, 9681* (MO, NY). **San Martín:** Alto Río Huallaga, Juan Jui, *Klug 3830, 4344* (K, NY).

Acknowledgments. We thank the curators of the herbaria cited for making their specimens available and Fabiana Filardi for providing digital images of type materials housed at RB. We are grateful to Alex Popovkin for reviewing the English text and to Carla de Lima for the line drawings. Roy Gereau, Darién Prado, and Victoria C. Hollowell are also acknowledged for their helpful suggestions on the manuscript. Funding was provided by Ph.D. grants from Coorde-

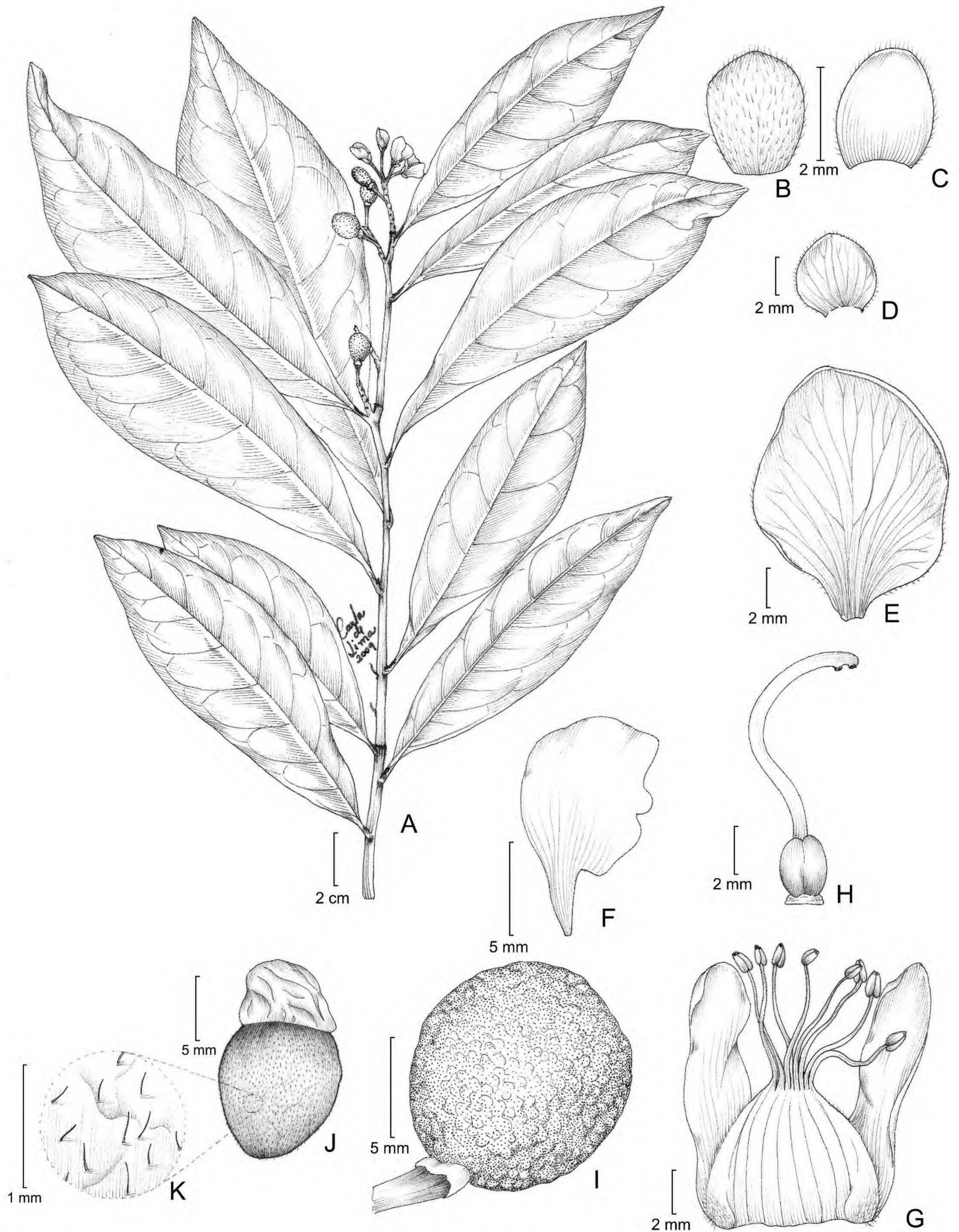


Figure 2. *Acanthocladus santosii* (Wurdack) J. F. B. Pastore & D. B. O. S. Cardoso. —A. Flowering branch. —B. Bract dorsal face. —C. Bract ventral face. —D. External inferior sepal. —E. Internal sepal (wing). —F. Carina. —G. Androecium and lateral petals. —H. Gynoecium. —I. Fruit. —J. Seed. —K. Detail of seed indumentum. Drawn by Carla de Lima from *W. Thomas et al. 11232* (HUEFS).